

1984 to be year of financial rebuilding, reduced construction spending for utilities

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Barring unforeseen difficulties, 1984 should be a good year for utilities. Good, but not great, as heavy generation construction programs (especially nuclear programs) continue to wind down, internal generation of funds improves and external requirements decrease, earnings increase and regulatory problems diminish.

According to EL&P's survey of utility organizations, security firms, industry associations and government agencies, many of the actions and movements of this year can be expected to continue in 1984. However, as a number of contacts point out, 1984 is an election year and that means anything could happen. However, the betting seems to be that the fact of the election may serve to remove attention from utilities as legislators focus pre-election efforts on more pressing, popular causes.

Construction spending to decline

Projections based on EL&P's survey of electric utility organizations indicate that construction spending by electric utility organizations should total \$37-billion in 1984. This represents a decrease of \$2.6-billion, or 6.7 percent, from our estimates of total electric utility industry capital spending in 1983.

The decline is especially noticeable for generation spending. Utilities reported that capital spending for generation will total about \$23-billion, a slide of some \$5.6-billion from this year and even \$2.5 billion under generation construction in 1982.

There is one caveat here, however, and that is that several utilities currently involved in completing major multi-unit nuclear plants provided data for their generation construction aside from the nuclear program. In other words, nuclear utilities could be forced to spend substantial amounts beyond their current plans, like it or not, and the totals projected by EL&P could be understated by several hundred million dollars. The odds are good, however, that the majority of the additional spending will go for highly labor-intensive operations and for debt service, rather than for hardware or apparatus.

T/D spending to climb

Spending for transmission, distribution and substation additions should be up in 1984, according to EL&P's survey. If utilities live up to their current plans, capital spending in these areas should total \$12.6-billion, ahead a hearty \$2-billion from 1983 spending.

Largest amount would be devoted to distribution, where utilities indicated that some \$6.3-billion will be spent.

Transmission spending should total \$3.4-billion, according to the survey. Spending for substations, rated for both transmission and distribution, is projected to reach \$2.8-billion.

Actually, spending estimates for both transmission and distribution are somewhat overstated and spending estimates for substations is somewhat understated because some utilities lumped substation spending into their plans for transmission and

distribution construction, rather than stating them separately as requested.

As indicated in the table below, the greatest construction activity will take place in the Southeast (SERC) and in the Far West (WSCC), where planned total capital spending is estimated to be \$9.5-billion and \$6.4-billion respectively.

EEI survey results

Bruce Humphrey, director of energy modeling and economic research for the Edison Electric Institute, says the EEI doesn't "do forecasting as such, but we do explore alternative scenarios." The most popular scenario for energy sales, he said, is for kilowatt-hour use to increase at the same rate as the economy. He noted that electric-intensive industry recovered slower in 1983 than the economy as a whole, but expressed a belief that faster improvement will be recorded in 1984. With the Gross National Product expected to grow at a rate of 4- to 5-percent annually in 1984, kWh sales may be expected to increase similarly.

EEI has made a survey of investor-owned electric utility construction spending and suggests a total of \$36.7-billion for 1983 and \$34.6-billion in 1984, declining steadily to \$27.8-billion in 1987.

Humphrey said the declining level reflects the winding down of power plant projects. A turnaround is not expected until 1990 or later.

Improved performance expected

While other industry analysts disagree on whether construction expenditures have peaked or if they will peak this year or next, the picture they agree upon is one that is getting brighter. The trend, they agree, is favorable; the financial condition of utilities is improving markedly.

"The industry is starting to get healthy," notes Mark Luftig, head of the utility analysis division at Solomon Brothers.

For the 100 companies that Solomon Brothers monitors, construction expenditures will peak this year. Solomon Brothers data indicates that these companies will spend \$31.3-billion on construction in 1983, declining to \$30.1-billion in 1984 and \$27.7-billion in 1985.

As construction expenditures decline, more plants are completed and are put into the rate base. Moving plant capital expenditures into the rate base transfers Allowances for Funds Used During Construction (AFUDC) into a cash-earning status, which contributes to utility earnings. AFUDC is the aggregated non-cash return a utility accrues on its capital investment. Regulatory commissions allow AFUDC to be converted into "cash" from customers only after the facilities are completed (or are largely completed, in some states) and become "used and useful."

According to Solomon Brothers' top 100 electric utilities' statistics, about 43.5 percent of the 1983 construction expenditures (or about \$13.6-billion) will be financed with internally generated funds. By 1985, says Luftig, this figure will rise to about 67.2 percent of total construction spending or about \$18.6-billion.

1984 CAPITAL SPENDING (\$1000s BY N.E.R.C. REGION)

	Generation	Substations ¹	Transmission ²	Distribution ²	Other	Total
NPCC	1,555,525	151,588	153,837	682,958	85,401	2,629,309
MAAC	1,584,530	512,767	170,815	466,215	144,645	2,858,972
ECAR	3,962,093	236,397	474,956	535,977	265,681	5,475,104
SERC	6,146,171	369,149	1,123,504	1,519,251	361,753	9,519,828
MAIN	2,151,678	76,146	71,738	563,062	143,005	3,010,629
SPP	2,528,516	195,794	493,530	570,596	155,836	3,944,272
ERCOT	1,706,049	168,927	223,180	370,574	189,048	2,657,778
MAPP	127,566	103,461	57,351	168,630	29,058	486,066
WSCC	2,955,891	1,023,095	647,279	1,475,798	281,433	6,383,496
Total	22,698,019	2,837,324	3,416,190	6,358,061	1,655,960	36,965,854

Source: EL&P Survey

1. Includes both transmission and distribution substations, where given as a separate category. Actually understated because a number of respondents reported substation investments were included in transmission and distribution programs.

2. Overstated because some companies included substation investments in transmission and distribution construction programs.

The increasing portion of construction funds generated internally by utilities means that less new money will be required and raised in the debt market.

Duff & Phelps analyst Thomas P. Halligan envisions electric utility construction expenditures to increase through 1984, then decline at least through 1987. For Duff & Phelps, 1984 will be the peak year in construction expenditures, and, says Halligan, will be higher than calculated earlier because a number of power plants expected to be completed in '83 will not be completed and licensed until 1984 and later.

Duff & Phelps estimates that 1983 construction expenditures will be \$36.7-billion, rising to \$37-billion in 1984. About \$18.3 billion, or roughly half the 1983 expenditures will be from internally generated funds. Next year, about \$22.5-billion (or 60 percent) of the 1984 industry construction budget will be internally generated.

Acid rain to force spending

Countering the progress in decreasing construction spending in the next few years is an anticipated, but as yet unquantified, increase in the construction of pollution control systems. Analysts agree that some form of acid rain legislation may be forthcoming in the second session of the current Congress, beginning next January. What is hard to predict, they say, is the form that legislation may take.

Figures ranging from \$6-billion to as much as \$23-billion are offered as educated guesses of the amounts that might be required for pollution control over the next few years.

None of the industry organizations contacted by EL&P wants to be accused of being anti-environment, but raise strong questions about how much is actually known about acid rain, its real causes and effects. The National Rural Electric Cooperatives Association follows the reasoning of other major industry organizations, questioning the so-called "evidence" and calling for more research as a step to better understanding of the problem. However, a spokesman suggested that if it is demonstrated that Midwest utilities, including generation and transmission cooperatives, are responsible for the acid rain problems plaguing the Northeastern U.S. and

Canada, then the utilities involved will take action.

Alex Radin, peppery executive director of the American Public Power Association, says he sees no legislative action on acid rain in 1983, but believes there will be action in Congress next year. He calls for a nationwide emissions tax, to be applied to all sources of emission.

Federal deficits and interest rates

Uncertainties over the magnitudes and effects of large budget deficits continues to confound most analysts. Duff & Phelps' Halligan comments that deficits of the order of \$200-billion are not, of themselves, necessarily disastrous, provided that they remain historically proportionate to Gross National Product. But if the economy is sluggish, or turns downward, such large deficits could have enormously harmful impacts.

Mark Luftig of Solomon Brothers notes that, given the apparent disinclination of Congress to either cut federal expenditures or to raise taxes in an election year, the Federal Reserve System may be forced to tighten the money supply. Such an action could result in higher interest rates, at least in the short term.

Relatively high interest rates are one reason why "interest rate swaps" are likely to remain attractive. Interest rate swaps are financial schemes where a borrower in the U.S. will raise money at floating interest rates, while a counterpart in Europe raises money at fixed rates. The payment streams then are traded, although not the principal obligations themselves. The advantage to the U.S. borrower is that it can obtain funds at a lower, fixed rate of interest.

Luftig suggests that other innovative financing techniques will continue to be employed although, in contrast to creative financing a few years ago that were used in order to gain access to otherwise unobtainable funds, creative financing today is used more to get around high domestic interest rates.

Even if interest rates remain largely where they are today, Luftig says, it appears likely that there will be considerable debt refunding over the next few years. There is about \$15-billion of maturing utility debt coming due. In addition, even at interest rate levels of about 13 percent, Luftig

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suggests that it will be economical to refund as much as \$25-billion of non-maturing debt as well. This would call for rolling over debt incurred about 5-years ago, when interest rates were on the order of 15- to 16-percent.

In the event that interest rates drop a few points, perhaps to the 10-percent level, Luftig says that another \$20-billion of debt could be refunded, bringing total potential refunding requirements to nearly \$60-billion by 1987.

At the same time, the bond market is seeking higher yields and investors

Energy Outlook," which was released to the public in mid-1983, 14,107 MW of new capacity will be added this year by December 31. An added 18,118 MW is projected to go into service in 1984. Over the period 1984-1987, DOE estimates that an average of 18,709 MW will be added in each of the four years, resulting in some 74,837 MW of new capacity going into service by the end of 1987.

In its electricity policy report, DOE said that a 3-percent load growth through the year 2000 translates into a need for an additional 438

ing power plants. Such efforts, he said, are very cost-effective and involve fewer regulatory problems than new plants. He said he believes a resurgence of nuclear power interest is at least 10 years down the road.

Dim nuclear future

As reported elsewhere in this issue (see article reporting on the proceedings of the Atomic Industrial Forum meeting, page 3), the outlook for the nuclear industry seems to be a hang-on-and-pray-a-lot situation, despite what AIF Chairman Wallace Behnke, Commonwealth Edison vice chairman, said in prepared remarks and in a press conference. Behnke focused his appraisal of progress largely on developments begun earlier, but continuing, and glossed over some of the larger problems before the industry, such as the general anti-nuclear mood of the public, the debates of the Washington Public Power Supply System, the Zimmer plant of Cincinnati Gas & Electric, minimal progress on the cleanup of TMI-2 and the probable rate shock imposed by large nuclear plants, including those of Behnke's own company, and the continuing morass of Nuclear Regulatory Commission retrofit and licensing activity.

Observers generally agreed that Behnke's enthusiasm did not appear to be warranted by the general dark picture portrayed by suppliers of nuclear systems and many of their utility customers.

Regulatory outlook

One of the current points of controversy, around which swirls both a utility's need for adequate return on its construction investment and the social benefit of husbanding excess capacity to meet the future needs of its customers, is the issue of marketing.

Electric utilities increasingly are turning to more aggressive marketing activities in an effort to promote kWh sales, especially as they contribute to improved load factor. They do this against a backdrop of growing regulatory and social awareness of the need for and effects of conservation. It seems clear that regulatory agencies will be called upon to find a balance between these two concepts in the years ahead.

Even though the president of the National Association of Regulatory Utility Commissioners does not believe that conservation and the marketing of electricity are necessarily mutually exclusive, he does caution that simultaneous promotion of the two concepts will have to be done "artfully."

Larry Wallace says that 1984 will be a year of "planning, thinking and organizing" marketing strategies, and he believes it will be well into 1985 before anyone is likely to see well-thoughtout approaches by the industry as a whole. Broadly defining conservation as "the efficient use of electricity," the retiring chairman of the Indiana Public Service Commission notes that the coalescence of marketing and conservation occurs when electric utilities promote the use of idle capacity for new and more efficient applications. Its basis is embodied in Wallace's notion of "special rates for special processes."

NARUC assistant general counsel Charles Gray observes, however, that there could be some rough spots along the way. He points out the potential for anti-competitive claims small business groups as behemoth utilities begin to move into marketing specific appliances, such as the heat pump. Noting that utilities have some decided promotional advantages, such as updated customer listings, potential promotion through bill in-

serts, access to special financing, Gray suggests that utilities may take the lion's share of such new sales, at the sacrifice of its trade allies. He does admit, however, that the movement of utilities into such areas could also create new markets that are not present today. "Nevertheless, there could be a lot of pressure on regulators to decide these anti-competitive claims."

Another major regulatory concern involves equitable treatment for low-income groups that have difficulty paying their electric bills. Currently there are a variety of special programs aimed at relieving the acute problems of this growing group. One problem is targeting the truly needy, distinguishing them from those with the ability to pay but without the willingness to do so.

More generally, the NARUC executives think there may be a stabilization of regulation with respect to financing the industry as power plants are completed and go into rate bases. Observers point out that there still will be vigorous debates in some regions as nuclear utilities and regulatory agencies battle over how to put massive amounts of new plant investments into the rate base while muting the rate shock that surely will follow.

But the breakup of AT&T and the de-regulation (or re-regulation) of natural gas seem likely to draw much of the attention and efforts of regulators. Although some observers believe that these developments could push electric utility regulation "into the back seat," others suggest that from now on "the front seat will just be more crowded."

But, then, 1984 is an election year, with a number of governors coming up for reelection, and that means crazy things can happen.

Suppliers see slight rebound

Sales of power equipment, after a small estimated 0.4 percent decline in 1983, are expected to move upward again in 1984. The National Electrical Manufacturers Association (NEMA) is hopeful of a 2.7 percent improvement in 1984. To keep this in perspective, however, remember that the projected 6.3 percent average growth rate for sales of all electrical equipment is expected to run behind the growth rate of the economy as a whole. And more importantly, it must be noted that of NEMA's eight product groupings, power equipment is projected to have the lowest growth rate.

These projections were released in conjunction with NEMA's 57th Annual Meeting in Washington. The association's power equipment group is composed of manufacturers of most of the products used by electric utilities, including steam turbine-generators, power transformers, switchgear, circuit breakers, surge arresters and protective equipment, power capacitors, insulators, connectors, line and substation hardware. Also included are tapered steel structures, poles and the like. NEMA did not provide dollar figures.

1984 CAPACITY ADDITIONS BY N.E.R.C. REGIONS (MW)

	1983 Capacity	1984 Capacity	1984 Additions	1984 % Change
NPCC	51,890	52,850	1,160	2.24
MAAC	47,480	48,800	1,320	2.78
ECAR	92,500	96,120	3,620	3.91
SERC	125,650	128,800	3,150	2.51
MAIN	43,760	45,190	1,430	3.27
SPP	60,550	62,310	1,760	2.91
ERCOT	43,860	45,400	1,540	3.51
MAPP	28,490	28,440	-50	-0.18
WSCC	107,740	109,920	2,180	2.02
	601,720	617,830	16,110	2.68

Source: North American Electric Reliability Council Statistics and EL&P Projections.

don't appear to be so discriminating about quality, Luftig observed.

Finally, there appears to be some general agreement that electric utility enthusiasm for dividend reinvestment is dwindling. While there are a number of companies that will continue to issue shares of common with 5 percent discounts, many others are dropping the practice. Some will phase out the use of this method for selling stock because their equity ratios are getting up to where companies want them.

Margins adequate

As construction expenditures peak this year or next, and as more generating plants are completed and go into service, reserve margins should remain strong. According to the Department of Energy, the healthy reserve margin is expected to continue. In the longer term, out about 1990, for example, there are likely to be capacity shortages unless there is a resurgence of construction activity.

In the mid-term, DOE estimates that peak demand will increase at about 4-percent per year through 1985 as the economic recovery builds to full-steam. After this, DOE sees peak demand increasing at about 3 percent annually during the period from 1985 through 1990. Through 1987 DOE expects reserve margins to remain above 35 percent nationally.

Although DOE normally confines itself to longer range forecasts, Jeffery Skeer of DOE's Office of Policy, Planning and Analysis, provided EL&P with the near-term numbers, noting that these were consistent with the 1990 estimates DOE released as part of its June 1983 report of the Electricity Policy Project (see EL&P, August 1983, page 1). The report, called "The Future of Electric Power in America: Economic Supply for Economic Growth," stated that current institutional, regulatory and financial constraints were imposing powerful disincentives on electric utilities to invest in new generating capacity. Unless these disincentives can be overcome, the report said, they would lead to a measurable lessening of electric service reliability by 1990 and inadequate generation capacity a few years later.

According to DOE's "1982 Annual

GW of capacity by the end of the century. This would mean that average annual capacity additions of about 23,053 MW per year would be needed over the 19 years from 1981.

The implications of these numbers are that, given DOE assumptions, annual capacity additions already are deficient by about 19 percent, and these calculations are based on plants that were started before the now dominant reluctance of electric utility managements to commit new funds to new generation.

Generally running counter to DOE's assumptions, however, are developments that could mitigate against implied generation deficiencies. Included are growing awareness that electricity demand and national economic growth may not be coupled, increasing employment of load management and conservation techniques, use of cogeneration and installation of small power production facilities by non-utility entrepreneurs.

APPA's Radin agrees that determining the need for power in the future is an overriding issue. In an earlier presentation to an Americans for Energy Independence Conference in Washington, Radin suggested that under a moderate-growth scenario (3 percent GNP growth and 2 percent annual increase in the price of electricity) only 647 GW would be required, instead of the North American Electric Reliability Council's 'projected' 710 MW. He pointed out that post-1981 additions of 152 GW to reach the NERC figure would provide a reserve margin of 31 percent in 1990 and average margins of 34 percent over the period from 1982 through 1989, but that only 75 GW would be required under the moderate growth scenario. "Given the magnitude of future capacity requirements and the high cost of building power plants, conservation and a variety of energy sources should be looked at first as a means to meet the nation's energy requirements," he commented.

Radin said he believes there will be continued interest in small, conventional power plants when new capacity is needed. He also suggested that utilities will devote more effort to upgrading and refurbishing older exist-

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See the January issue
of
Electric Light & Power

TVA quantifies value of burning physically cleaned coal or plant operating, maintenance, FGD costs

Washed coal can reduce boiler outages, maintenance costs, and flue-gas desulfurization costs, according to recent reports from the Tennessee Valley Authority.

The TVA work, largely sponsored by the U.S. Dept. of Energy and the Environmental Protection Agency, seeks to justify the added costs of conventional coal cleaning over purchase of raw coal by quantifying the benefits. In recent years use of washed coal has declined as utilities sought to reduce fuel costs.

A study done by consultants Battelle-Columbus and Hoffman-Holt examined boiler performance data and coal quality at 60 TVA generating units during the years 1962-1980. According to a paper given at the recent Joint Power Generating Conference, the study shows that lower levels of ash, moisture, and sulfur in the incoming coal result in higher boiler efficiency, fewer forced outages, and reduced maintenance costs. Using a model derived from the study researchers predicted savings equivalent to from \$1.50 to \$2.00 a ton of coal from using clean coal at certain power plants.

The examination of boiler efficiency showed that, while it was difficult to separate the effects of boiler age and

coal quality, large changes in coal ash and moisture can have a significant effect. "For example," says the JPGC paper, "increasing coal ash from 8 to 20 percent and moisture from 6 to 10 percent will reduce boiler efficiency by 0.66 percent."

Availability improved

The study also showed a relationship between ash and sulfur levels and boiler outage hours. Over the range of coal ash in TVA's coal, 12 to 24 percent, the relationship showed that increasing ash levels were associated with as much as 360 outage hours per year, as shown in Table 2. Sulfur levels, ranging from 1 to 5 percent, could account for as much as 870 hours. Together, the two coal contaminants account for 1400 unplanned outage hours.

Using the values shown in the table, including the replacement power costs, the researchers compared a change from a coal with 20 percent ash and 4 percent sulfur to a coal with 10 percent ash and 1 percent sulfur. The value of the lower coal in terms of reduced replacement power alone was calculated to be \$1.64 per ton of coal for a 100-MW base-loaded unit.

Reduced ash effect studied

Effect of reduced ash and sulfur on the cost of maintaining the pulverizers, boilers, and other coal-related equipment was also studied. Results are shown in Table 1. An "extreme" change in coal quality, from 20 percent ash and 4 percent sulfur to 12 percent and 1 percent, would produce maintenance savings equal to \$0.36 per ton of coal.

A summary of the kinds of savings that could be expected at typical plants for the areas covered in the study is shown in Table 3. The total saving in this example, going from 18 percent ash and 2.5 percent sulfur to 12 and 1.5 percent, is a saving of \$1.57 per ton of coal.

FGD cost reduction

Another related study of the effect of coal quality on FGD costs was reported at the recent EPA/EPRI symposium on FGD in New Orleans. Using the coal-cleaning model developed by Battelle Columbus as a starting point a new model was developed that shows potentially large FGD costs

savings through use of coal cleaning.

The basic conclusion, reported TVA engineer Charles Wright, is that combining coal cleaning with flue-gas desulfurization can sometimes produce lower net costs than use of tail-end flue-gas cleaning alone. For an extreme case such as high sulfur Illinois 6 coal the combination can reduce costs 15 to 20 percent, he reported.

Wright warned that in some cases coal cleaning can lead to an increase in particulate collection costs. Coal cleaning will reduce sulfur dioxide in the flue gas and increase fly ash resistivity, reducing the effectiveness of electrostatic precipitators.

Wright said that the benefits of coal

cleaning are site-specific but he added that for the cases studied with the TVA model the net effect on leveled annual cost of power reduction ranged from an increase of 0.5 percent to a decrease of 22.6 percent from using coal cleaning and FGD.

(The papers used as sources for this data were "Examining relationships between coal characteristics and the performance of TVA boiler plants: summary," ASME, 1983 JPGC, by Richard Barrett, Elmer Holt, Gregory Mack, and Robert Frank; and "Computer economics of physical coal cleaning and flue gas desulfurization," 1983 EPA/EPRI symposium on FGD, by Charles Wright, Terry Tarkington, and James Kilgroe.)

EFFECT OF CHANGING VALUES FOR VARIABLES ON UNPLANNED OUTAGE HOURS			
a. Effect of ash (Sulfur = 3.5 percent, age = 20 years)			
Ash, percent	Forced Outage Hours	Outage Hours Compared to Baseline	Incremental Cost of Replacement Power for 100 MW Load, 1979 dollars
12.0	773	-38	(25,018)
13.5	811	0	0
16.0	870	+68	46,376
20.0	999	+198	126,216
24.0	1128	+325	221,650
b. Effect of sulfur (Ash = 12.5 percent, age = 20 years)			
Sulfur, percent	Forced Outage Hours	Outage Hours Compared to Baseline	Incremental Cost of Replacement Power for 100 MW Load, 1979 dollars
1.0	390	-421	(287,122)
2.0	522	-288	(186,416)
3.0	787	-10	(75,000)
3.5	811	0	0
4.0	999	+129	87,876
5.0	1288	+418	288,536
c. Effect of boiler age (Ash = 12.5 percent, sulfur = 3.5 percent)			
Boiler Age, years	Forced Outage Hours		
0	176		
10	292		
20	811		
30	1453		
40	1708		

Table 2. Effect of coal quality on outage hours.

IMPACT OF COAL QUALITY ON A 1965 MW PLANT ^(a) —SYSTEM MODEL ^(b)			
	Coal A	Coal B	Savings
Ash, percent	18	12	
Sulfur, percent	2.5	1.5	
Moisture, percent	8	6	
Heating Value, Btu/lb	17,824	13,500	
Coal Fired, 10 ⁶ ton/yr	5,823	5,426	
Efficiency, 10 ⁶ dollars	—	—	0.307
Efficiency, \$/ton	—	—	0.06
Unplanned Outage Hours, hr	225/1225	448/794	
Lost Generation, 10 ⁶ MW hr	1,987	3,202	
Incremental Cost of Replacement Power, 10 ⁶ dollars	8,951	6,126	3,825
\$/ton	1.71	1.13	0.58
Maintenance Costs for Coal-Related Equipment, 10 ⁶ dollars	10,180	9,416	5,766
\$/ton	1.75	1.55	0.20
Total Savings, 10 ⁶ dollars			8,600
Total Savings, \$/ton			1.57

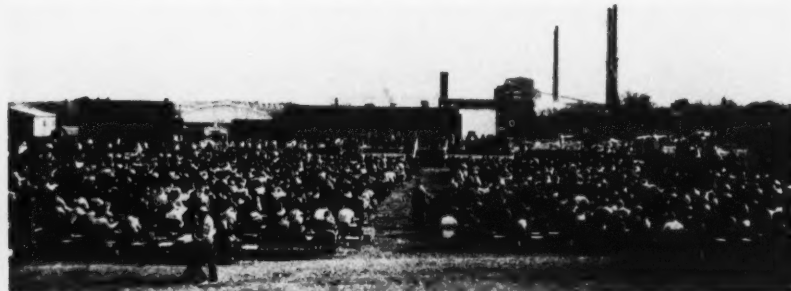
(a) Using Wideman Creek plant data for age, efficiency, availability, and maintenance cost studies, and cost of replacement power; and using 80 percent annual load factor, 10,000 hr/yr for heat rate, and \$20/ton coal cost.
(b) Using system-wide models for relationships.

Table 3. Net effect of coal ash and sulfur levels on costs.

EFFECT OF CHANGING COAL CHARACTERISTICS ON MAINTENANCE COSTS (100 MW plant, 80 percent annual load)	
a. Effect of ash (sulfur = 3.5 percent)	
Ash, percent	Maintenance Cost, Selected Coal-Related Equipment, 1979 dollars
12	1,529,000
13.5	1,823,000
16	1,612,000
20	2,148,000
24	2,540,000
b. Effect of sulfur (ash = 12.5 percent)	
Sulfur, percent	Maintenance Cost, Selected Coal-Related Equipment, 1979 dollars
1.0	1,383,000
2.0	1,484,000
3.0	1,575,000
3.5	1,623,000
4.0	1,673,000
5.0	1,794,000

Table 1. Effect on maintenance costs.

MPC's Colstrip 3 & 4 dedicated



More than 3,500 persons attended the dedication ceremonies of Montana Power Company's coal-fired Colstrip Units 3 and 4 in October. The 700,000-kW plants are the largest single construction project in Montana history. Finished at a cost of \$1.8 billion, the Colstrip units are partially owned by MPC, Puget Sound Power & Light, Portland General Electric Co., Washington Water Power Co. and Pacific Power & Light.

Business optimism at highest level in four years, says D&B

NEW YORK—Business optimism among the nation's executives has reached its highest level since the second quarter of 1979, according to a recent Dun & Bradstreet Corp. survey of business expectations.

D&B reports that this is the third straight quarter that optimism about sales and profits has improved. More than 1,470 business leaders were interviewed for the latest survey.

"Durable goods manufacturers reported the greatest increase in optimism, indicating that the recovery is indeed strengthening through all sectors of the economy," said D&B corporate economist and chief statistician Joseph W. Duncan.

The overall Sales Optimism Index (the percentage of executives expecting sales and profits increases minus the percentage expecting decreases) rose four points to 72, said D&B. This latest increase follows increases of 13 points for third quarter expectations and 18 points for the second quarter.

In terms of industry sectors, durable goods manufacturers expressed the greatest change in optimism with a seven point index increase to 65. D&B said the outlook among both non-durable goods manufacturers and retailers improved by three points, to 74 and 82 respectively.

Optimism declined eight points among wholesalers. Almost 18 percent of wholesalers foresee a dip in sales in the fourth quarter.

New orders expected

D&B survey results showed that the percentage of new manufacturers expecting an increase in new orders edged closer to 75 percent.

The Profits Optimism Index for all sectors climbed three points to 62, the brightest outlook since the second quarter of 1979. Durable goods manufacturers registered the greatest

gain in profits optimism with a six point increase. D&B said wholesalers also expect bottom line improvements in the fourth quarter, despite their expectations for reduced sales.

The survey results point to an improving employment outlook. For the fourth quarter of 1983, 28 percent of the executives surveyed said they expect to add to their payrolls, the largest percentage in this sector since 1976. About 36 percent of the durable goods manufacturers said they expected to increase their hiring.

And 26 percent of the retailers said they expected to add to their payrolls. Only wholesalers indicated plans to reduce employment levels.

C&NW gets interest in Wyoming line

CHICAGO—Chicago & North Western Transportation Company finally has succeeded in obtaining a half-interest in an 103-mile coal line to Wyoming's Powder River Basin at a cost of \$76.2 million.

The Burlington Northern Railroad said it dropped its request for a U.S. Supreme Court review of its litigation asking to overturn a 1982 Interstate Commerce Commission decision directing that C&NW be sold the half-interest in the line.

Both railroads received permission from the ICC in 1976 to build the line to the Powder River Basin. However, C&NW couldn't come up with its share of the construction money in 1979 and the BN took over the line.

C&NW eventually sought to get back in the project, which resulted in last year's ICC decision.

A Burlington Northern spokesman said only that it was "a management decision" to drop the litigation.

3rd quarter performance . . . from page 1

suggests further substantial gains in the year ahead."

For electric utilities, the unusually hot summer coupled with some recovery in industrial sales meant healthy third quarter gains.

Operating revenues for the 34 electric utilities surveyed by *EL&P* rose 9.3 percent in the third quarter, compared to the same period in 1982.

Utilities in the depressed North Central region, such as American Electric Power, Ohio Edison and Detroit Edison, all watched industrial sales and earnings per share rise in the third quarter.

AEP earnings per share skyrocketed 87.9 percent to \$.62, while operating revenues increased 11.9 percent in the third quarter. W.S. White, Jr., AEP chairman, attributed the numbers to the hot summer and an improvement in industrial sales and sales to other utilities.

Detroit Edison said major increases in sales to the steel and automotive industries and their related suppliers resulted in a 12.1 percent increase in third quarter industrial sales and a total kilowatt-hour sales increase of 13.7 percent. Operating revenues jumped 19.9 percent and earnings per share rose 18 percent to \$.72 a share in the quarter ending September 30.

Even Ohio Edison, which has been extremely hard hit by industry closings and slowdowns, saw good signs in the third quarter. A growth in the automotive sector helped industrial

sales of electricity rise 15.9 percent. Commercial sales increased 9.7 percent and residential sales increased 11.1 percent.

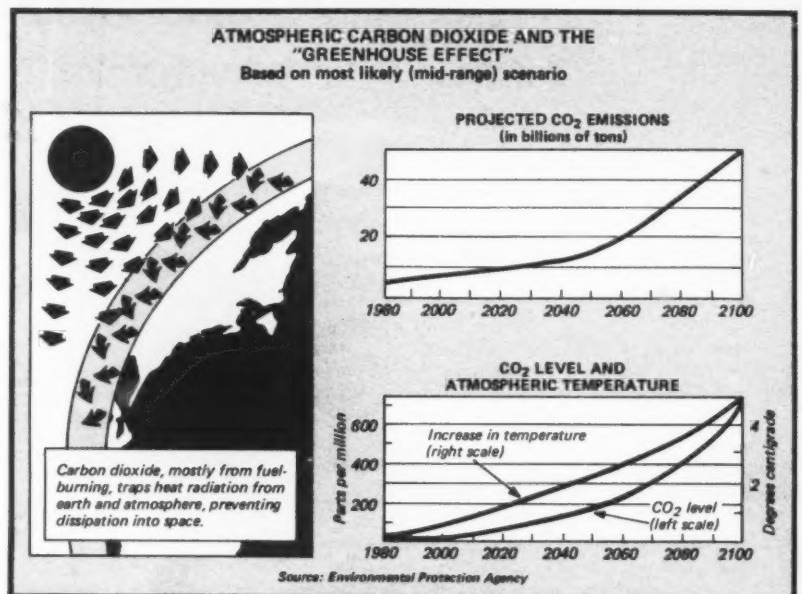
The Ohio utility cited "continued improvement in the local economy and unusually hot, humid weather, which increased air conditioning use" as the main reasons for the pick-up in kilowatt-hour sales. OE reported a 23.4 percent increase in earnings per share for the third quarter and a 3.2 percent rise in operating revenues.

But some utilities were not as fortunate. Pennsylvania Power & Light earnings per share fell 9.5 percent to \$.67 a share, while third quarter operating revenues nudged ahead 0.2 percent. PP&L placed the blame on the Pennsylvania Public Utilities Commission's recent decision disallowing a return on 12.6 percent of the utility's investment in generating plants.

Although operating revenues rose 17.4 percent, earnings per share dropped 2.0 percent at Minnesota Power. Jack F. Rowe, chairman and chief executive, said the "essentially flat earnings" were due to prolonged production cutbacks within Minnesota's taconite mining industry.

Prolonged heat waves across the country this summer were the major contributors to the overall improvements in electric utility health.

Con Ed, IP&L and Iowa Resources, were among the other utilities that cited weather as the reason for the improved third quarter.



decreases in precipitation and associated runoff could "severely affect" the Texas Gulf, Rio Grande, upper and lower Colorado River regions, California and other western areas. The report warned that much of the irrigated farmland in these areas "might have to be abandoned unless water could be imported from other regions with more abundant supplies."

Sea level rising

The National Research Council committee predicts that the sea level may rise two ft over the next century, compared to its current rate of four to eight inches per century, an increase of up to 667 percent.

Although the committee's findings pointed to greater study before taking any action to deal with the greenhouse effect, the EPA report warned that a "sobriety and sense of urgen-

cy should underlie our response to a greenhouse warming."

Authors Stephen Seidel and Dale Keyes, of the National Research Council, also warned that "our findings support the conclusion that a global greenhouse warming is neither trivial nor just a long-range problem."

Fossil fuel ban no help

Both groups seem to agree that a ban on the use of fossil fuels would not help diminish the greenhouse effect.

Said the National Research Council, "By itself, shifting the fuel mix within fossil fuels is highly unlikely to achieve a reduction of CO₂ concentrations by more than a few parts per million by the year 2100, even if accomplished globally."

In its report, the EPA said a total fossil-fuel ban would only delay the warming effect a few years.

3RD QUARTER STATISTICS				
Utility	'83 EPS	% Change	'83 Rev (000)	% Change
American Electric Power	\$1.22	+87.9	1,134,000	+11.8
Arizona Public Service	\$1.22	-1.6	298,000	-3.0
Baltimore Gas & Electric	\$2.08	+38.3	428,780	+7.9
Carolina Power & Light	\$1.80	+5.3	448,720	+11.5
Central & Southwest	\$1.22	+7.0	828,445	+8.5
Central Hudson Gas & Electric	\$1.94	+4.4	94,000	+9.0
Central Illinois Public Service	\$1.19	+101.7	211,830	+83.6
Central Louisiana Electric	\$1.00	+23.5	95,400	+8.8
Consolidated Edison	\$1.68	+43.5	1,628,117	+18.1
Detroit Edison	\$1.72	+18.0	658,377	+19.9
Dominion Resources	\$1.32	+10.1	216,700	+20.3
Eastern Utilities Associates	\$1.79	+41.1	73,015	+7.4
Florida Power & Light	\$2.14	+8.2	993,310	+6.8
Florida Progress	\$1.94	+22.1	380,828	+17.8
Hawai Electric Industries	\$1.03	+41.1	155,886	-13.6
Houston Industries	\$1.81	-2.4	1,219,764	-1.7
Indianapolis Power & Light	\$1.44	+34.5	121,152	+13.6
Iowa Resources	\$1.73	+38.2	106,005	+15.9
Long Island Lighting Co.	\$1.89	+9.9	479,039	+16.0
Minnesota Power	\$1.98	-2.0	95,593	+17.4
Montana-Dakota Utilities	\$1.27	-20.6	51,881	-17.7
Montana Power	\$1.60	+13.1	69,286	+2.4
Niagara Mohawk Power	\$1.52	+4.0	562,707	+10.1
Northern States Power	\$1.50	+14.5	418,900	+17.3
Ohio Edison	\$1.58	+23.4	388,400	+3.2
Orange & Rockland Utilities	\$1.07	+20.2	124,565	+14.4
Pennsylvania Power & Light	\$1.67	-9.5	285,161	+2
Philadelphia Electric	\$1.78	+6.8	688,269	+1.0
Potomac Electric Power	\$1.31	+1.3	406,511	+14.5
Public Service of New Mexico	\$1.03	+6.2	107,227	-9.6
Rochester Gas & Electric	\$1.79	+9.1	151,838	+5.2
Texas Utilities	\$1.56	+6	1,411,912	+6.1
Utah Power & Light	\$1.58	-1.7	225,450	+11.8
Wisconsin Power & Light	\$1.19	+35.2	132,900	+21.3
TOTAL			14,402,936	+9.3

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY



Electric utilities prepare for acid rain action from EPA

Much of the pressure for acid rain regulations in the U.S. is coming from Canada where political leaders are calling for action to protect the country's lakes and forests from what they say is U.S.-originated acid rain. Special report on page 8 outlines what utilities can expect in 1984.

LP&L confronts technical, QA issues as Waterford-3 is readied for fueling

Investigative series by newspaper spurs NRC inquiry

CHICAGO—Louisiana Power & Light has been asked to publicly document that its Waterford-3 nuclear plant has been constructed safely and conforms to accepted quality assurance standards.

Even as the plant is being readied for initial fuel loading and low-power testing, a controversy has arisen over whether there are technical and quality control deficiencies in construction.

The issue came up at a luncheon gathering of security analysts in this midwestern city. Floyd W. Lewis, chairman and president of Middle South Utilities, the holding company

of which Louisiana Power & Light is a subsidiary, quickly defended the integrity of the plant when questioned by concerned analysts.

Lewis addressed one of the principle allegations leveled at the utility about construction of Waterford-3. It has been charged that there are cracks in the foundation base-mat—a 12-ft thick concrete structure that extends out under the whole plant area.

Referencing independent consultant studies on the problem that recently had been delivered to LP&L, Lewis told the Chicago analysts, "These independent studies indicate that the mat is absolutely sound and

that there are no structural problems with it."

The staff of the Nuclear Regulatory Commission, after looking into the matter, concluded that while there indeed were cracks in the foundation base-mat, they were not likely to affect the component's structural integrity.

But according to the NRC's Sherwin Turk, the agency has advised LP&L to implement surveillance of the facility's foundation mat to make sure that the water, which currently flows benignly through the cracks, does not later become corrosive, attacking steel reinforcement bars that strengthen the concrete base.

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SEC adopts 415 rule governing securities sales

WASHINGTON, D.C.—A final rule for the shelf registration of securities has been adopted by the Securities and Exchange Commission.

Implementation of Rule 415 follows 18 months of experience with revised and expanded shelf registration. The procedure allows certain companies to register debt and equity securities with the SEC and then keep them "on the shelf" for up to two years before offering the instruments for sale.

Traditionally, debt and equity securities have been offered immediately after the SEC made the registration effective, although for some time the agency has allowed some instruments to be sold on a continuing basis. The new Rule 415 for the first time institutionalizes the ability of securities issuers to deliberately delay the sale of securities after SEC registration approval, pending the development of what the seller determines is a vigorous market.

The final rule, which became effective December 31, 1983, authorizes certain domestic securities issuers, including electric utilities that can meet specific criteria, to take advantage of this delayed issuance. But this 415 authorization takes place against a complex backdrop of regulations governing "traditional shelf filings" that have been in effect for years and remain virtually unchanged by the new rule.

In general, the rule is available for securities sellers qualified to use the so-called short-form registration statements. Traditional shelf offerings also continue to be available.

Specifically, short form S-3 requires that company stock have an aggregate market value (not counting that held by company affiliates) of at least \$150 million. However, a company can qualify if it has \$100 million in stock and an annual trading volume of at least three million shares.

The S-3 form defines non-convertible debt or preferred securities as "investment grade" if, at the time of the effectiveness of the registration statement, at least one nationally recognized statistical rating organization

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T-G order famine ends; Westinghouse lands twin-unit order

ORLANDO—A two-year famine in large steam turbine-generator ordering by U.S. utilities ended in late December with an announcement by Westinghouse's steam turbine generator division that it landed an order.

Westinghouse said it will supply two 572-MW units to Southwestern Public Service Co. Engineering on the first unit has started and it is slated for delivery in the late 1980s to a

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